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THE SCREENING EFFICACY OF THE ENLISTED PERSONAL INVENTORY (SHIPLEY): A STUDY OF 2164 GREAT LAKES RECRUITS

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Summary

This report is concerned with the current predictive efficiency of the Enlisted Personal Inventory (Shipley). Since this instrument proved to be a reasonably successful screening device in World War II, its revalidation on a post-war military sample appeared to be of practical interest.

The Inventory was given to 2164 naval recruits prior to and independently of psychiatric evaluation at Great Lakes Naval Training Center during November, 1951. A follow-up study of the military suitability of the recruits was made approximately six months later. Successful completion of recruit training was the criterion of "normal" aptitude-for-service.

Finding

1. Approximately seven per cent (158 men) of the total group of 2164 recruits failed to complete recruit training. Of this group, 74 men (approximately 3.5 per cent) failed to complete training because of obvious personal unsuitability. An additional group of 66 men (approximately 3 per cent) failed to complete training because of one type or other of organic medical disability.

2. The mean Personal Inventory score of the 2006 men who had completed recruit training was 3.3.

3. The mean Personal Inventory score of the 66 men who were discharged because of neuropsychiatric disability was 6.5 and was significantly higher than the mean score of the "normal" group.

4. The mean Personal Inventory score of the 66 men who were discharged because of organic medical disability was 5.6 and was significantly higher than the mean score of the "normal" group.

5. The mean Personal Inventory score of the 8 men in disciplinary confinement at the time of the follow-up was 3.5 and was not significantly different from the mean score of the "normal" group.

6. Comparison of the results with those of war-time studies of the predictive efficiency of the Personal Inventory indicates that the Inventory is apparently not quite as effective a predictive instrument as it was during the war. Nevertheless, it still retains a fair degree of predictive efficiency.

Conclusion

The Enlisted Personal Inventory (Shipley) still possesses considerable usefulness as a brief screening device to identify personnel who warrant more extensive evaluation of their personal fitness. If the Inventory is used for this purpose, the results of the present study suggest the employment of a cutting score of "6" and "7" (rather than "8" or "9", as was used during World War II).

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INTRODUCTION

The investigation herein reported is one of a series of studies concerned with the development and validation of aptitude-for-service tests for enlisted personnel in the Navy.

The Shipley Personal Inventory (2) was developed during World War II by ONR project N-113 for use as a psychiatric screening device. While both a "long" 145-item form and a "short" 20-item form were developed, it was the latter form which enjoyed extensive use during the war because of its greater practical utility. A predictive validation of the screening efficiency of the short form, based on "psychiatric dispositions" made independently two months after testing, was done in 1944 (3). Effective differentiation was demonstrated, although to a somewhat lesser degree than in a non-predictive situation. Tables were provided to show the proportion of discharged men who would have been identified at each cutting score.

Since this instrument appeared to be a reasonably successful screening device in World War II, it was decided that a revalidation of it on a post-war military sample would be of practical interest. An additional reason for its revalidation was that the predictive efficiency of newly developed screening instruments could be compared with that of the Personal Inventory.

PROCEDURE

The Inventory was slightly modified for use in the present project in that four items were transformed into the forced-choice type characteristic of the other 16 items. This was done because of suggestive evidence in the literature that the forced-choice type of inventory tends to be somewhat more discriminative, to minimize response sets and, in certain situations, to reduce the incidence of "false positive" scores. The slightly modified inventory is presented in Appendix A.

The performances were scored in terms of the number of "abnormal" choices made. In cases of omissions, i.e., failure to mark either alternative, the score was adjusted.

The Inventory was administered to 2164 naval recruits prior to and independently of psychiatric evaluation at Great Lakes Naval Training Center during November, 1951. Testing was accomplished through the cooperation of the Classification Department of the Training Center. The recruits took the test in groups of 50-100 on the same day when the classification test battery was given. Conditions for group testing with respect to provision for adequate understanding of instructions, for insuring independent answering, etc., were close to ideal.

A follow-up study of the military suitability of the recruits was made approximately six months later. Successful completion of recruit training, theoretically requiring a period of thirteen weeks, was the criterion of "normal" aptitude-for-service.

RESULTS, DISCUSSION AND CONCLUSIONS

The disposition of the 2164 recruits at the time of the follow-up study is shown in Table 1. It will be noted that 158, or approximately 7 per cent, of the men failed to complete recruit training. Of this group, 74 men (unsuitability discharges, disciplinary confinement), or approximately 3.5 per cent, failed to complete training because of obvious personal unsuitability. An additional group of 66 men, or approximately 3 per cent, failed to complete training because of one type or other of organic medical disability.

The mean Personal Inventory score for each dispositional group is also shown in Table 1. It will be seen that the "Normal" group, i.e., those who had completed recruit training, has a lower mean score than any other group. The mean Inventory scores of both the "Unsuitability" and the "Medical Disability" groups are significantly higher than that of the normal group ($p=.01$ in each instance)[1]. Of the other four groups listed in Table 1, the mean score of those located as still being in recruit training is the only one which differs impressively from that of the "Normal" group ($p=.05$)[1], but the number of subjects in these groups is too small for much confidence to be placed in the comparisons.

It is of some interest that the mean scores of the "Unsuitability" and the "Medical Disability" discharges are fairly similar and do not differ significantly. This would seem to be particularly desirable in a screening device designed to detect "inaptitude-for-service" in general, no matter what the reason for inaptitude may be. From the standpoint of military efficiency, medical risks constitute as serious a problem as do personally inadequate individuals and if the former can be screened as well as the latter by a psychological procedure this is an unexpected advantage.

The relationship between specific diagnosis and Personal Inventory score in the "unsuitability" group is shown in Table 2. The number of cases in the various diagnostic subgroups is far too small to permit valid inferences but some of the differences appear interesting enough to warrant further study. The "Mental Deficiency" subgroup shows a particularly high mean score but this may have been due to lack of comprehension of the Inventory items. The "Enuresis", "Inadequate Personality" and "Somnambulism" subgroups likewise show excessively high mean scores. In contrast, the subgroups characterized by overt aggressive behavior ("Passive Aggressive Reaction", Antisocial Personality", "Psychopathic Personality", "Hostile Aggressive Reaction") show mean scores below the mean of the total group.

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1. Corrected for heterogeneity of variance by the approximation method of Cochran and Cox (1).

The relationship between specific diagnosis and Personal Inventory score in the "Medical Disability" group is shown in Table 3. It will be seen that there was a large number of diagnostic categories with a majority of these diagnoses applying only to one case. If attention is restricted to the five diagnoses which apply to at least four cases, possibly significant differences appear. Thus the "Myopia and other eye conditions" and "Otitis media" cases score within normal limits while the "Cardiac disease" and "Sinusitis" cases show excessively high mean scores, even above the mean of the "Unsuitability" group. The group of "Skin disorder" cases is also characterized by a relatively high mean Inventory score.

The question as to whether there are consistent and significant relationships between Personal Inventory score (or scores on other screening devices) and specific diagnostic category can hardly be answered with the data of the present short-term follow-up study. The long-term follow-up studies with larger numbers of cases which constitute the main purpose of this project will provide adequate data which can be utilized to evaluate this possibility which has such significant implications for psychomatic medicine as well as for military selection.

Table 1

Disposition and Personal Inventory Scores of

2164 Great Lakes Recruits

Disposition	N	Personal Inventory Score M	O
Normal completion of recruit training	2006	3.344	2,518
Discharged for unsuitability (neuropsychiatric)	66	6.544	4.265
Discharged for medical disability or deceased (one case)	66	5.620	3.725
Located in Naval Hospital	5	5.200	2.482
Located in Recruit Training	10	7.637	5.021
Disciplinary confinement (in process or due)	8	3.500	2.061
Discharged, miscellaneous	3	5.000	2.160
Total	2164	3.538	2.746

Table 2

Survey Diagnoses of "Unsuitability" Dischargees

Diagnosis	N	Mean P.I. Score
Somatization Reaction	1	11.0
Emotional Instability	1	11.0
Mental Deficiency	8	8.4
Enuresis	10	8.3
Special Learning Defect	1	8.0
Inadequate Personality	15	7.2
Somnambulism	6	7.0
Anxiety Reaction	3	5.7
Passive Aggressive Reaction	7	4.8
Immaturity Reaction	5	4.6
Antisocial Personality	2	3.5
Psychopathic Personality	1	3.3
Passive Dependency Reaction	5	3.0
Hostile Aggressive Reaction	1	3.0
TOTAL	66	6.5

Table 3

Survey Diagnoses of Medical Disability Dischargees

Diagnosis	N	Personal Inventory Score Mean	Rank
Congenital deformity	1	1	1.5
Perforation of nasal septum	1	1	1.5
Choroiditis	1	2	3
Bone infection	1	3	4.5
Ptosis	1	3	4.5
Myopia and other eye conditions	7	3.4	6
Acute meningoencephalitis (deceased)	1	4	9
Ganglion flexor, wrist	1	4	9
Subluxation	1	4	9
Bronchiectasis, bronchitis	2	4	9
(Cause undetermined)	2	4	9
Encephalopathy	1	4.2	12
Otitis media	6	4.7	13
Ankylosis	1	5	17.5
Asthma	1	5	17.5
Deafness	1	5	17.5
Diabetes mellitus	1	5	17.5
Malunion of fracture	3	5	17.5
Internal derangement of cartilage	3	5	17.5
Nystagmus	1	5	17.5
Vascular disease	1	5	17.5
Underweight	2	5.5	22
Deflection of nasal septum	2	6	23.5
Lordosis	1	6	23.5
Skin disorder	4	6.1	25
Cardiac disease	8	7.2	26
Sinusitis	5	8.6	27
Varicose veins	1	9	28
Epilepsy	1	10	29
Post-frostbite syndrome	1	10.7	30
Abscess	1	11	31.5
Ileitis	1	11	31.5
Arthritis	1	11.1	33

PREDICTIVE EFFICIENCY OF THE PERSONAL INVENTORY

During World War II, the Personal Inventory was utilized to screen out men in whose cases a personal interview to determine fitness for further service appeared to be indicated. This was accomplished by holding for interview all men scoring at or above a pre-determined "cutting" score, this score in actual practice being dependent in part upon the interviewing personnel available at a particular facility.

As has been indicated earlier in this report, the Inventory proved to be a reasonably successful screening device. A typical study (2) done at the Naval Training Center, Newport, R. I., showed that a cutting score of 7 correctly identified 60 per cent of the men who were subsequently discharged for personal unsuitability while it misidentified 13 per cent of the men who successfully completed training, the overall "interviewing cost" being 16 per cent of the total group. At a cutting score of 8, 53 per cent of the discharged group was correctly identified at an "interviewing cost" of 11 per cent of the total group. A cutting score of 9 correctly identified 50 per cent of the discharged group at an "interviewing cost" of 8 per cent of the total group. Because of practical considerations, this cutting score of 9, rather than the more sensitive score of 7, was generally utilized since the employment of the latter cutting score would have necessitated the interviewing of a greater proportion of the total group than was often feasible.

Table 4 shows the proportion of men in the non-discharged group, the discharged group and the total group placing at or above each Inventory score in the Newport study. Table 5 presents the same information, as well as additional data on the performances of medical disability discharges and men of questionable status, for the present post-war study.

Comparison of the findings of the two studies indicates that the Inventory is apparently not quite as effective a predictive instrument as it was during the war. Nevertheless, it still retains a fair degree of predictive efficiency. At a cutting score of 5, the proportion of unsuitability discharges correctly identified is 64 per cent, but this is accomplished only at a presumptive interviewing cost of 28 per cent of the total group. At a cutting score of 6, the proportion of correct identifications in the unsuitable group is 53 per cent, achieved at a presumptive interviewing cost of 18 per cent. A cutting score of 7 correctly identifies 42 per cent of the unsuitability group at a presumptive interviewing cost of 12 per cent of the total group.

Inspection of Table 5 also shows that the various cutting scores identify a significant proportion of men who were subsequently discharged for one type or another of organic medical disability. However, it will be noted that the Inventory appears to be somewhat less efficient for the prediction of this type of discharge than it is for the prediction of unsuitability discharges.

Table 4

Cumulative Percentage Falling At or Above Each Score on Original Short Form of the Personal Inventory (Format C) for a Group of Newport Recruits (2)

Score	Non-Discharges	Discharges	Total
20	0.00	0.00	0.00
19	0.18	0.00	0.18
18	0.18	3.33	0.35
17	0.18	3.33	0.35
16	0.18	3.33	0.35
15	0.37	3.33	0.53
14	0.74	10.00	1.23
13	0.92	13.33	1.58
12	1.29	13.33	1.93
11	2.40	30.00	3.85
10	3.70	40.00	5.60
9	5.55	50.00	7.88
8	8.69	53.33	11.03
7	13.12	60.00	15.59
6	19.04	60.00	21.19
5	28.65	70.00	30.82
4	40.48	73.33	42.21
3	57.86	86.67	59.37
2	78.00	90.00	78.63
1	95.56	96.67	95.62
0	100.00	100.00	100.00
	N = 541	N = 30	N = 571

Table 5

Cumulative Percentage Falling At or Above Each Score on the Revised Short Form of the Personal Inventory for the Great Lakes Group

Score	"Normals" (N=2006)	Unsuitability Discharges (N = 66)	Disability Discharges (N = 66)	Total Discharges (N = 135)*	Questionable Status (N = 23)	Total (N=2164)
20	0.00	0.00	0.00	0.00	4.35	0.05
19	0.00	1.52	0.00	0.74	4.35	0.09
18	0.05	3.03	0.00	1.48	4.35	0.18
17	0.10	6.06	0.00	2.96	4.35	0.32
16	0.15	6.06	0.00	2.96	4.35	0.37
15	0.25	6.06	1.54	3.70	4.35	0.51
14	0.45	6.06	3.08	4.44	4.35	0.74
13	0.80	7.58	4.62	5.93	4.35	1.16
12	1.35	13.64	4.62	8.89	4.35	1.85
11	1.64	18.18	13.85	15.56	4.35	2.54
10	2.59	21.21	20.00	20.00	17.39	3.84
9	4.29	22.73	24.62	22.96	17.39	5.59
8	6.58	34.85	32.31	33.33	26.09	8.46
7	9.97	42.42	38.46	40.00	34.78	12.11
6	16.10	53.03	44.62	48.15	43.48	18.39
5	25.52	63.64	56.92	59.26	52.17	27.91
4	38.58	75.76	66.15	71.11	60.87	40.85
3	57.13	84.85	75.38	80.74	73.91	58.78
2	76.07	87.88	84.62	86.67	95.65	76.94
1	92.07	98.48	92.31	96.30	100.00	92.42
0	100.00	100.00	100.00	100.00	100.00	100.00

*"Total Discharges" includes four miscellaneous discharges in addition to those classified as "Unsuitability" and "Disability".

UTILIZATION OF THE PERSONAL INVENTORY AS A SCREENING DEVICE

While the findings of the present study appear generally somewhat less impressive than those reported in war-time studies, it seems clear that the Personal Inventory still possesses considerable usefulness as a brief screening device to pick out cases who warrant further examination. If the Inventory is to be used for this purpose, the present results suggest that a score of 6 or 7 (rather than 8 or 9 which was used during the war) be employed as a cutting score.

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APPENDIX A

PERSONAL INVENTORY, FORMAT C (SUI Revision) RESTRICTED

Name_____ Ser. No._____ Date_____

Age_____ Sex_____ Place_____ Company_____

In each question, mark (X) the answer which fits you best. Even if neither answer fits you very well, mark the one that fits you better than the other.

1	I graduated from high school ( )	1	I did not graduate from high school ( )
2	I was a sickly child ( )	2	I was an active child ( )
3	I have felt bad more from head cold ( )	3	I have felt bad more from dizziness ( )
4	I seek excitement ( )	4	I avoid excitement ( )
5	I like to have people do things my way ( )	5	I like to have people figure things out for me ( )
6	I am more nervous ( )	6	I am more easy going ( )
7	Somehow I never could find enough to do in my free time ( )	7	My free time always seemed to be filled ( )
8	I wish I wouldn't feel so tired ( )	8	I wish I could have a more responsible job ( )
9	I wish I could have more excitement ( )	9	I wish I weren't bothered by bad dreams ( )
10	I wish I didn't have so many aches and pains ( )	10	I wish I wouldn't keep changing my mind ( )
11	I wish I weren't so nervous ( )	11	I wish I wouldn't keep putting things off ( )
12	I wish I could get myself to take more chances ( )	12	I wish worrying wouldn't make me sick to my stomach ( )
13	I have more headaches than the average person ( )	13	I do not have as many headaches as the average person ( )
14	The hours at night seem long ( )	14	The hours at night pass very quickly ( )
15	I like most any kind of food ( )	15	I have a poor appetite ( )
16	After exertion I feel hungry ( )	16	After exertion I feel dizzy ( )
17	When excited I feel weak ( )	17	When excited I feel stronger ( )
18	I think I might like to watch a surgical operation sometime ( )	18	The sight of blood upsets me ( )
19	My heart sometimes speeds up for no reason at all ( )	19	I never notice my heart beating ( )
20	I have never gone to a doctor for headaches or dizzy spells ( )	20	I have occasionally gone to a doctor for headaches or dizzy spells ( )